An ISO 9001 Company







# **Design 53 Pressure Blower**

# More Versatile, More Applications

## Pressures to 91" sp Volumes to 18,000 cfm

Chicago's Design 53 single stage pressure blowers are ideal for combustion air, pneumatic conveying systems, fluid bed aeration, cooling, drying systems, and recommended for use in various high pressure applications.

With pressures to 91" wg and volumes to 18,000 cfm, the range of the Design 53 has been widened to include a selection of 70 wheel/housing combinations. Four arrangements and eight discharge positions are available for most models. The new larger sizes, designated N, P, Q, and R are available as Arrangement 1, 4, 8 and 9, with eight discharge positions at 45° increments. Although direct drive is specified for most applications, belt drive is available.

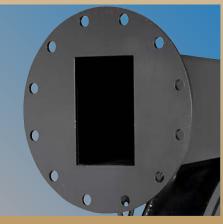
With such a wide range of performance there is a standard Chicago pressure blower model to meet every requirement without lengthy lead times or custom pricing. Chicago Blower representatives located throughout North America and around the globe welcome the opportunity to evaluate your application. Put Chicago Blower's experience and "Industrial Quality" fan building expertise to work for you.

Chicago Blower Corporation is certified for ISO 9001.

# Standard Design Features



**Slip Fit Inlet** 



Flanged Outlet

## **Rugged Housings**

Housings and pedestals stand up to the rigors of strenuous duty, delivering smooth vibration-free performance. Housings are fabricated of continuously welded heavy gauge steel, and rigidly stiffened. Wheel access is provided by the removable inlet cover plate.

## **High Strength Wheels**

Chicago Pressure Blowers incorporate a fabricated high-strength aluminum alloy or carbon steel wheel to handle substantially increased tip speeds at temperatures to 650° F. Wheels are gas metal arc welded using precision fixtures in lieu of riveting. Taperlock bushings secure the wheel to the shaft.

## **Shafts and Bearings**

Engineered shafts have a critical speed at least 1.35 times maximum rpm. Bearings are either industrial duty ball type or roller in cast iron pillow block.

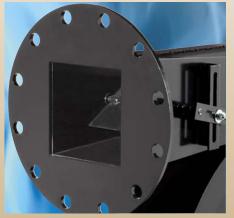
## Slip Fit Inlet

The standard slip-fit inlet accommodates customer field mounted ductwork or flexible connectors. Optional flanged inlets and venturi inlets are available to meet installation requirements.

## **Flanged Outlets**

Standard flanged outlets with ANSI 125/150 pipe flange bolt pattern and hole size readily connect to flanged piping. Flanges are continuoiusly welded to the housing.

# **Optional Accessories**



**Outlet Volume Control** 



Venturi Inlet

#### **Outlet Volume Control**

The control damper is built directly into the discharge. Manual control with locking quadrant or automatic operation with pneumatic or electric actuator.

#### **Flanged Inlet**

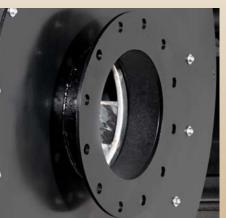
Flanges have ANSI 125/150 pipe flange bolt pattern and bolt circle dimensions to readily connect to flanged piping. Flanges are continuously welded to the inlet.

#### Venturi Inlet

Venturi inlets assure optimum performance by providing smooth airflow into the wheel. Venturi Inlets are required on open inlet blowers to meet catalog performance.

#### **Inlet Filters**

Both paper and reusable wire mesh filters consist of the element, a base mounted to the fan inlet, and a lid secured to the fan with wing nut. Filter silencers and rain hoods available.



Flanged Inlet



Lug Type Butterfly Valve

#### **Butterfly Valves**

Butterfly blast gate valves fine tune performance or vary the flow. Lug type mounts to the flanged inlet/outlet. Wafer type mounts between two matching flanges for manual or modulating control.

#### **Outlet Slip Tube**

Slip-fit tubes bolted to the outlet flange are standard Schedule 40 pipe. Slip tubes dimensioned to fit flexible hose are also available.

#### **Flex-Sleeve**

Rubber flexible connector, helps isolate the fan from system vibration. Sleeve is backed with a corded rubber cover held with stainless steel clamps.

#### **Vibration Pads**

Vibration transmission is reduced by mounting low density cork pads between the fan pedestal and the floor.

#### **Inlet Guard**

Designed to prevent intrusion on open inlets, a guard fabricated of concentric rings is mounted on the inletSafety



Inlet Filter



**Safety Guards** 

#### Safety Guards/Extended Fittings

Guards surround shaft, bearings and coupling. Included extended grease fittings facilitate bearing lubrication.

#### **Housing Drain**

A 1/1/2" NPT half coupling is welded at the lowest point of the scroll. Matching drain plug is also available.

#### **Discharge Elbows**

Elbows allow the discharge flange to clear the motor pedestal on some downblast and top angular down discharges. Models are noted on the Dimension pages.

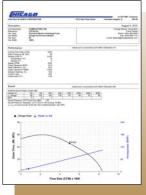
#### **Shaft Seals**

Seals reduce leakage where the shaft passes through the housing. Seals are not considered gas tight.

#### **Special Coatings**

To meet certain applications, several special paints and corrosion resistant coatings are available.





Refer to Chicago Blower's Selection program, fan.net, for performance, fan curves and sound data.

Contact your local Chicago Blower sales engineer for software and assistance.

## **Blower Selection**

The performance curves shown on the following pages illustrate the D/53 Pressure Blower's operational range. Red curves indicate volume vs. pressure, the blue curves indicate volume vs. brake horsepower. Refer to *fan.net* selection software when a specific performance point with greater detail is required. Operating range is stable over the entire curve from 0 flow (block off) to wide open volume.

## **Temperature / Altitude Correction**

When the pressure blower will not be handling standard air, corrections will be necessary. Apply the factors from this table.

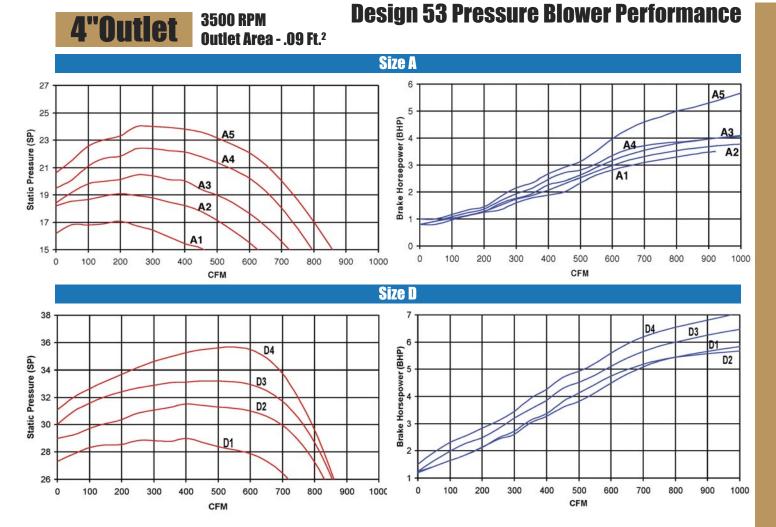
#### **Example:**

Assume a requirement of 900 CFM and 25" SP to operate at 140°F and 1500' altitude. From the table we have a factor of 1.20. (A) Multiply the pressure by the factor: 25" x 1.20 = 30" SP. (B) Select a fan for 900 CFM. The graphs on the following pages indicate a Size E2 blower with 6" outlet requiring 6.4 BHP. (C) Divide the BHP by the factor:  $6.4 \div 1.20 = 5.33$  BHP. The selection would read: Size E2 for 900 CFM, 25" SP,  $140^{\circ}$ F, at 1500' altitude, and a corrected BHP of 5.33.

AIR		ALTITUDE (feet) with BAROMETRIC PRESSURE (HG)														
TEMP	0´ 500´		1000´	1500´	2000´	2500´	3000´	3500´	4000´	5000´						
(F°)	29.92 29.38		28.86	28.33	27.82	27.31	26.82	26.32	25.84	24.90						
-40	.79	.81	.82	.84	.85	.87	.88	.90	.92	.95						
-15	.84	.86	.87	.89	.90	.92	.94	.95	.97	1.01						
0	.87	.88	.90	.92	.93	.95	.97	.99	1.00	1.04						
40	.94	.96	.96	1.00	1.01	1.03	1.05	1.07	1.09	1.13						
70	1.00	1.02	1.04	1.06	1.08	1.10	1.12	1.14	1.16	1.20						
80	1.02	1.04	1.06	1.08	1.10	1.12	1.14	1.16	1.18	1.22						
100	1.06	1.08	1.10	1.12	1.14	1.16	1.18	1.20	1.22	1.27						
120	1.09	1.11	1.13	1.16	1.18	1.20	1.22	1.24	1.27	1.31						
140	1.13	1.15	1.17	1.20	1.22	1.24	1.26	1.29	1.31	1.36						
160	1.17	1.19	1.21	1.24	1.26	1.28	1.31	1.33	1.35	1.41						
180	1.21	1.23	1.25	1.28	1.30	1.32	1.35	1.37	1.40	1.45						
200	1.25	1.27	1.29	1.32	1.34	1.36	1.39	1.42	1.44	1.50						

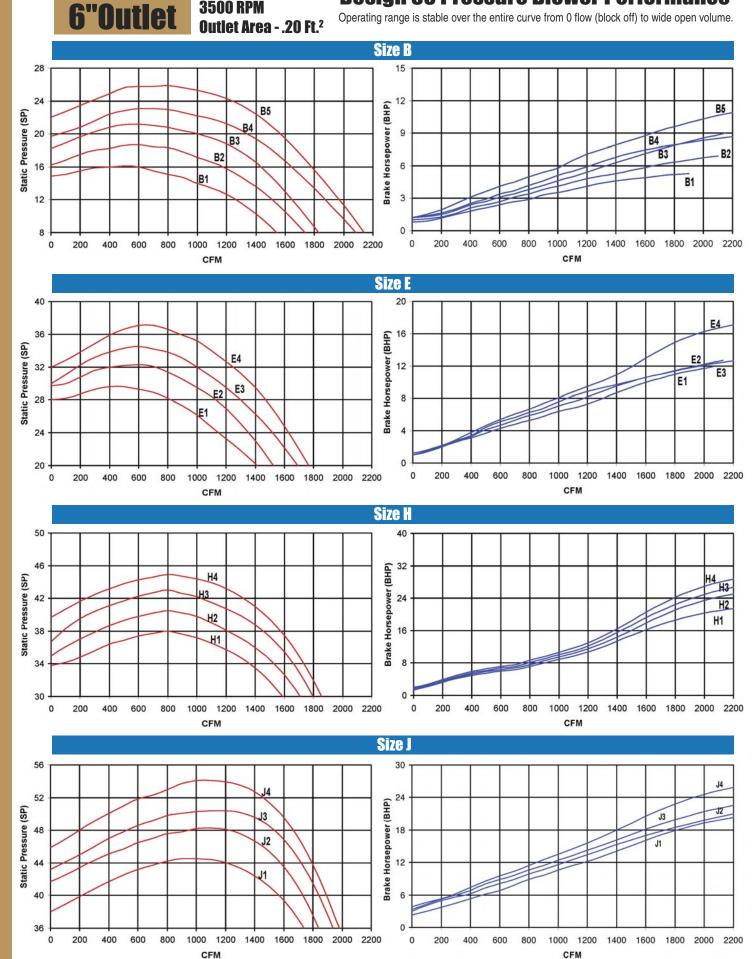
Correction factors for temperature (F) and altitude (above sea level):

standard air = .075 lbs. per cubic foot at sea level, 29.92" barometric pressure and 70° F



## **Design 53 Pressure Blower Performance**

Operating range is stable over the entire curve from 0 flow (block off) to wide open volume.



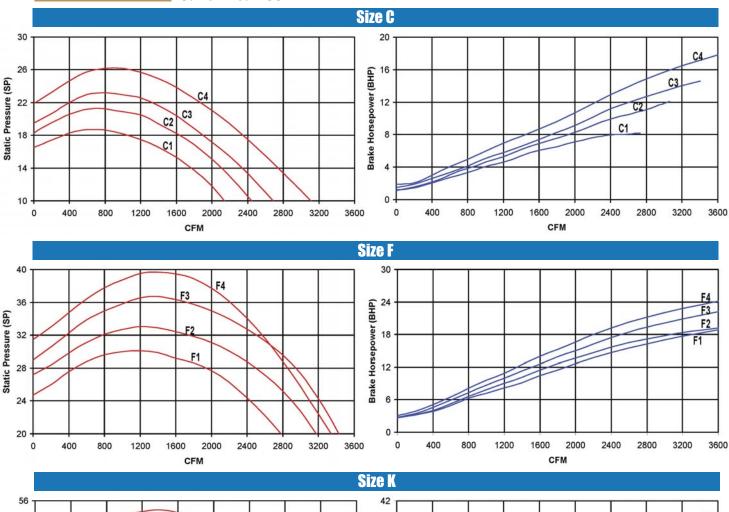
3500 RPM

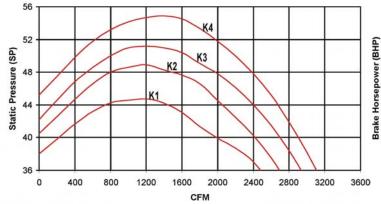
3500 RPM Outlet Area - .35 Ft.<sup>2</sup>

8"Outlet

## **Design 53 Pressure Blower Performance**

Operating range is stable over the entire curve from 0 flow (block off) to wide open volume.





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## More Blowers For More Applications

34

26

#### **Pressure Air Fans**

Heavy radial wheels are recommended for pollution control applications, such as continuous duty of primary air on burners, pulverizers, fluidizers and scrubbers. Options include abrasion and corrosion resistant materials. Variable widths and diameters provide exact performance.

Wheels to 100" Volumes to 440,000 CFM Pressures to 108" wg

### **Cast Aluminum Pressure Blowers**

Design 38 blowers ideal for fume/dust control, forced air drying and cooling. Match multiple wheels/inlets to eight housing sizes to meet required performance. Temperature to 200°F.

Sizes: 800 to 1829 Volumes to 5000 CFM Pressures: to 20" wg



K4

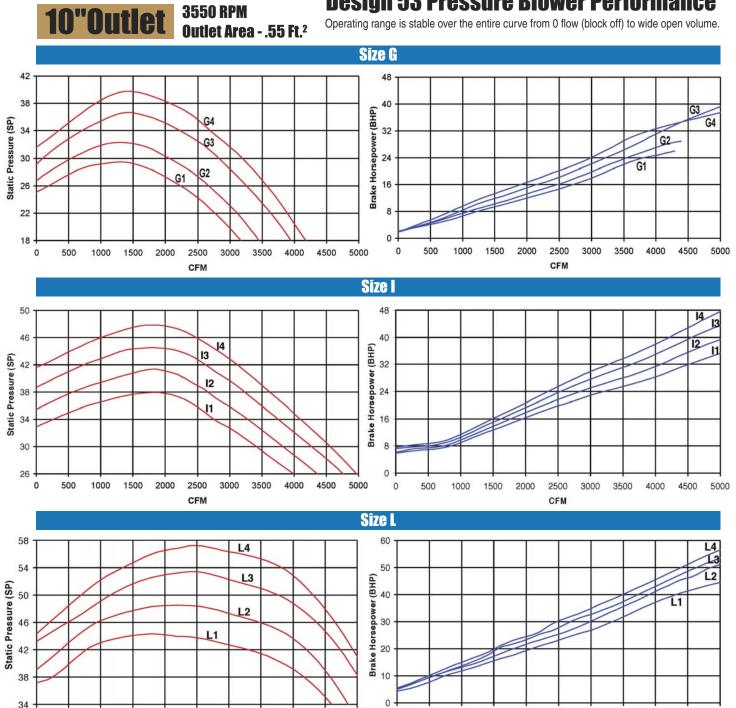
3600

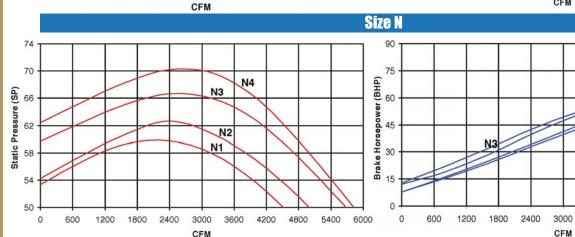
K2

K

## **Design 53 Pressure Blower Performance**

Operating range is stable over the entire curve from 0 flow (block off) to wide open volume.





1000 1500 2000 2500 3000 3500 4000 4500 5000



CFM

N2

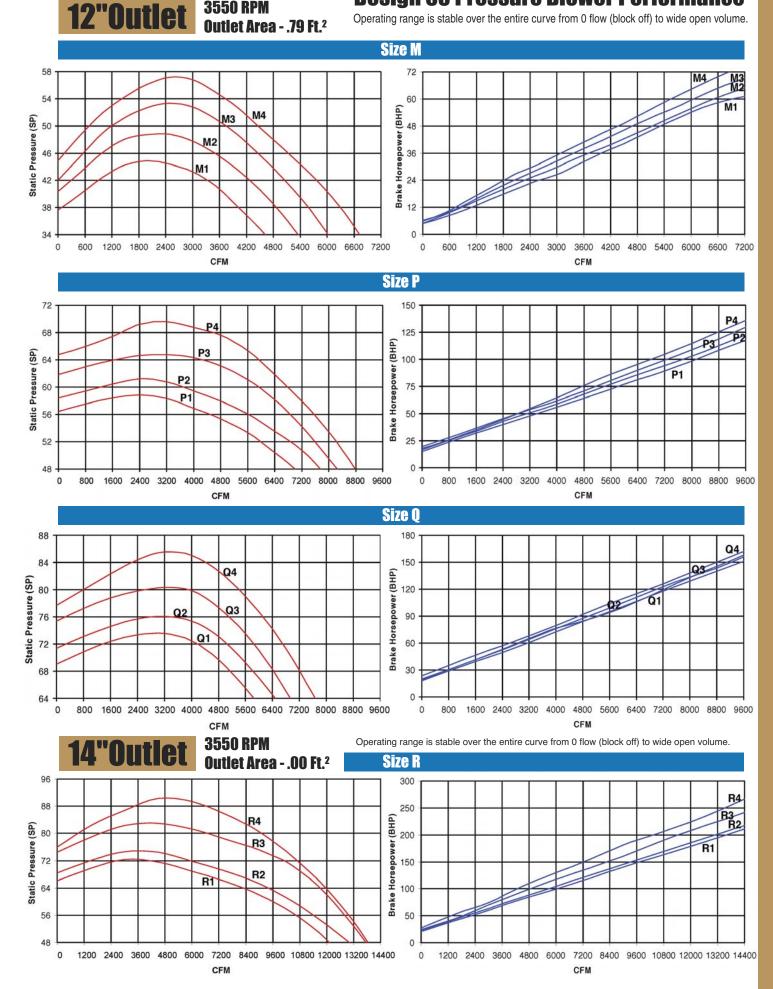
N4

N1

3550 RPM Outlet Area - .79 Ft.<sup>2</sup>

## **Design 53 Pressure Blower Performance**

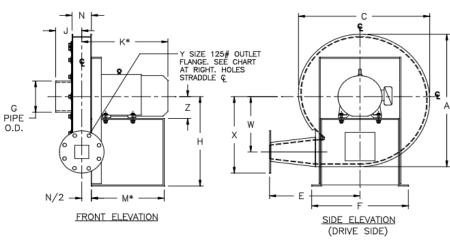
Operating range is stable over the entire curve from 0 flow (block off) to wide open volume

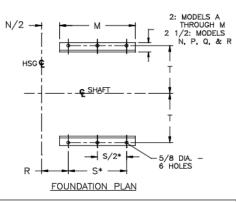


9









 ANSI STD.
 125#
 OUTLET
 FLANGE
 DATA

 PIPE SIZE
 Y\*
 4
 6
 8
 10
 12
 14

 B.C. DIA.
 7
 1/2
 9
 1/2
 11
 3/4
 14
 1/4
 17
 18
 3/4

 HOLE DIA.
 3/4
 7/8
 7/8
 1
 1
 1
 18
 3/4

 NO. OF HOLES
 8
 8
 8
 12
 12
 12

 PIPE O.D.
 4
 1/2
 6
 5/8
 8/5/8
 10
 3/4
 12
 3/4

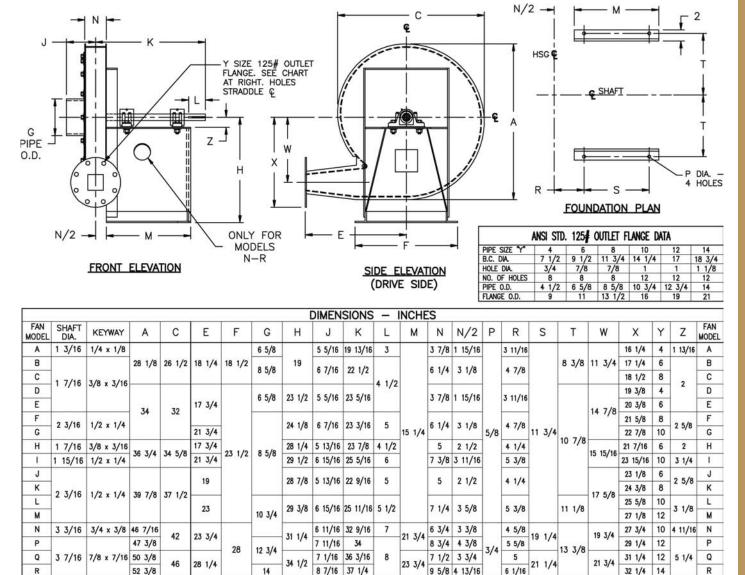
 FLANGE O.D.
 9
 11
 13
 1/2
 16
 19
 21

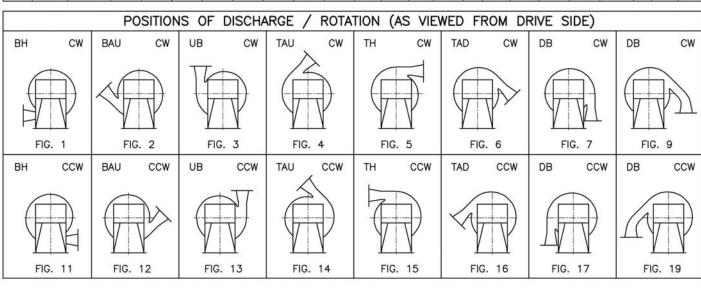
\*K, M, & S DIMENSIONS BASED ON THE LARGER OF THE TWO MOTOR FRAMES LISTED ON A LINE

DIMENSIONS - INCHES																						
FAN MODEL	FRAME	MOTOR FRAME METRIC	A	С	E	F	G	н	J	K*	M*	N	N/2	R	S*	S/2*	Т	W	X	Y		FAN MODEL
A	143T, 145T 182T, 184T 213T, 215T 254T, 256T	905, 90L 112S, 112M 132S, 132M 160M, 160L				19 1/2	6 5/8 8 5/8	17 3/4 19 19 3/4 20 3/4	5 5/16	13 3/8 14 5/8 17 7/8 20 7/8	12 17 1/2	3 7/8	1 15/16	3 3/8	8 5/8 14 1/8	4 5/16 7 1/16			16 1/4	4	3 5/8 4 5/8 5 3/8 6 3/8	<u>l</u> ^
в	1007 1047	1125, 112M 1325, 132M	28 1/8	26 1/2	18 1/4			17 3/4 19 19 3/4 20 3/4 19	6 7/16	14 5/8 15 7/8 19 23 7/8 15 7/8			3 1/8	4 9/16	8 5/8	4 5/16	8 7/8	11 3/4	17 1/4	6	3 5/8 4 5/8 5 3/8 6 3/8 4 5/8	в
с	213T, 215T 254T, 256T	112S, 112M 132S, 132M 160M, 160L						19 3/4 20 3/4		10	1					7 1/16			18 1/2	8	5 3/8 6 3/8	C C
D			34	32	17 3/4	23 1/2	6 5/8 8 5/8	23 24 24 3/4 23	5 5/16	13 3/8 14 5/8 17 7/8 13 3/8			5 7/8 1 15/16	3 3/8				19 3/8	4	3 5/8 4 5/8 5 3/8 3 5/8	D	
E	182T, 184T 213T, 215T 254T, 256T 143T, 145T	905, 90L 112S, 112M 132S, 132M 160M, 160L 90S, 90L						24 24 3/4 26 23	,	14 5/8					19 1/2	9 3/4			20 3/8	6	4 5/8 5 3/8 6 3/8 3 5/8	E
F	1451, 1451 182T, 184T 213T, 215T 254T, 256T 284TS, 286TS	112S, 112M 132S, 132M 160M, 160L						24 24 3/4 26		14 3/8 15 7/8 19 23 7/8 26	17 1/2 22 3/4 17 1/2	6 1/4	3 1/8	4 9/16 4 1/2	14 1/8 19 1/2	2 9 3/4 3 7 1/16			21 5/8 22 7/8	8	4 5/8 5 3/8 6 3/8	F
	284TS, 286TS 143T, 145T 182T, 184T	180M, 180L 90S, 90L 112S, 112M						26 3/4 23 24	6 7/16	26 14 5/8 15 7/8				4 9/16	14 1/8						7 1/8 3 5/8 4 5/8	
G	213T, 215T 254T, 256T	905, 90L 1125, 112M 1325, 132M 160M, 160L 180M, 180L			21 3/4			24 3/4 26		19 23 7/8 26				4 1/2	19 1/2		10 7/8				5 3/8 6 3/8 7 1/8	G
н	143T, 145T 182T, 184T 213T, 215T	905, 90L 1125, 112M 1325, 132M 160M, 160L			17 3/4			26 3/4 23 24 24 3/4	5 13/16	14	17 1/2	5	2 1/2	3 15/16	14 1/8	7 1/16		15 15/16	21 7/16	6	3 5/8 4 5/8 5 3/8	- 1
								26 3/4	5 13/16	25 3/8	122 3/4		2.72	3 7/8	19 1/2	9 3/4					6 3/8 7 1/8	
I	143T, 145T 182T, 184T 213T, 215T 254T, 256T	905, 90L 1125, 112M 1325, 132M 160M, 160L 180M, 180L 200M, 200L 905, 90M 1125, 112M	36 3/4	34 5/8	21 3/4			23 24 24 3/4 26	6 15/16	15 1/8 16 3/8 19 1/2 24 3/8 26 1/2		7 1/4	3 5/8	5 1/16		7 1/16			23 15/16	10	3 5/8 4 5/8 5 3/8 6 3/8	
_	284TS, 286TS 324TS, 326TS 143T, 145T	5 180M, 180L 5 200M, 200L 90S, 90M						26 3/4 27 3/4 23 24 24 24 3/4		26 1/2 28 3/4 14	22 3/4			5	19 1/2	9 3/4					7 1/8 8 1/8 3 5/8	
J	182T, 184T 213T, 215T 254T, 256T 284TS, 286T	112S, 112M 132S, 132M 160M, 160L 180M, 180I		37 1/2	19 23	- 23 1/2	8 5/8	24 24 3/4 26 26 3/4	5 13/16	15 1/4	17 1/2 22 3/4	5 2 1		3 15/16 3 7/8	,.	7 1/16 9 3/4	10 7/8	17 5/8	23 1/8 24 3/8	6	4 5/8 5 3/8 6 3/8 7 1/8	┨╻┨
к	143T, 145T 182T, 184T 213T, 215T 254T, 256T	905, 90M 1125, 112M 1325, 132M 160M, 160L 905, 90M 1125, 112M 1325, 132M 1325, 132M 160M, 160L 180M, 160L 180M 180L	39 7/8					24 24 3/4	5 13/16	15 1/4 17 18 3/8	17 1/2		2 1/2		14 1/8	7 1/16				8	3 5/8 4 5/8 5 3/8	ĸ
_	284TS, 286TS 254T, 256T	180M, 180L 160M, 160L						26 26 3/4 26		23 1/4 25 3/8 24 3/8	22 3/4	7 1/4	3 5/8	3 7/8	19 1/2 23 1/2	9 3/4			25 5/8	10	6 3/8 7 1/8 6 3/8 7 1/8	$\square$
L	2841S 286TS 324TS, 326TS 364TS, 365TS	180M 180L 5 200M, 200L 5 225M, 225L						28 1/4 29 1/4 30 1/4 26	6 15/16	26 1/2 28 3/4 31 3/8	26 3/4			5		11 3/4					7 1/8 8 1/8 9 1/8	
м	254T, 256T 284TS, 286TS 324TS, 326TS 364TS, 365TS	160M, 160L 180M, 180L 200M, 200L 225M, 225L						28 1/4 29 1/4 30 1/4	-					23					27 1/8	12	6 3/8 7 1/8 8 1/8 9 1/8	-м
N	254T, 256T 284TS, 286TS 324TS, 326TS 364TS, 365TS	160M, 160L 180M, 180L 200M, 200L 225M, 225L	46 7/16			24 1/2 29 1/2 24 1/2		33 5/8 34 3/8 35 3/8 34 1/8 35 1/8	6 11/16	31 5/8	/4 19 1/8 20 /8 21 5/8 /8 24 /8 17 5/8 /4 19 1/8 20 /8 21 5/8	6 3/4 8 3/4	3 3/8	4 3/4	19 1/8	7 7/16 8 3/16 8 5/8 9 9/16	11 3/8	10 0/4	27 3/4	10	6 3/8 7 1/8 8 1/8 9 1/8	N
Р	404TS, 405TS 254T, 256T 284TS, 286TS 324TS, 326TS	IBOM         180M           180M         180L           225M, 225L         255K           180M, 180L         200M, 200L           225M, 225L         180M, 180L           200M, 200L         225M, 225L           180M, 180L         200M, 200L           180M, 180L         225M, 225L           255S, 250M, 200L         160M, 160L           180M, 180L         225M, 225L           255S, 250M, 200L         205S, 250M	47 3/8	42	23 3/4			33 5/8 34 3/8	7 11/16	38 1/8 26 1/8 28 1/4 31			4 3/8	4 5/8 5 3/4	21 1/2 14 7/8 16 3/8 17 1/4	10 3/4 7 7/16 8 3/16 8 5/8	13 7/8 11 3/8		29 1/4	12	10 1/8 6 3/8 7 1/8 8 1/8 9 1/8	$\square$
	364TS, 365TS 404TS, 405TS	225M, 225L 250S, 250M				29 1/2		34 1/8 35 1/8		32 5/8 39 1/8 25 1/2				5 5/8	19 1/8 21 1/2 14 7/8	9 9/16 10 3/4 7 7/16	13 7/8				10 1/8	1 1
Q	404TS, 405TS 254T, 256T 284TS, 286TS 324TS, 326TS 364TS, 365TS 404TS, 405TS 444TS, 445TS	225M, 225L 250S, 250M, 250M, 160L 180M, 180L 200M, 200L 225M, 225L 250S, 250M 280S, 280M 160M, 160L 180M, 180L 225M, 225L 225M, 225L 280S, 280M 280S, 280M	50 3/8			24 1/2 29 1/2	12 3/4	35 3/8 34 1/8 35 1/8	7 1/16	25 1/2 27 5/8 30 3/8 32 38 1/2 44 3/4	5/8         19         1/8           3/8         20         32         21         5/8           1/2         24         3/4         27         3/4	7 1/2	3 3/4	5 1/8 5	16 3/8 17 1/4 19 1/8 21 1/2 25 1/4	8 3/16 8 5/8 9 9/16 10 3/4 12 5/8	11 3/8		31 1/4	12	6 3/8 7 1/8 8 1/8 9 1/8 10 1/8 11 1/8	Q
	447TS, 449TS 254T, 256T 284TS, 286TS 324TS, 326TS	160M, 160L 180M, 180L 200M, 200L		- 46	28 1/4	24 1/2		34 1/8 33 5/8 34 3/8 35 3/8		50 26 9/16 28 11/16 31 7/16	37 1/4 17 5/8 19 1/8 20	-	4 13/16	6 3/16	34 3/4 17 3/8 14 7/8 7 7/16 16 3/8 8 3/16 17 1/4 8 5/8		21 3/4			11 1/8 6 3/8 7 1/8		
R	R <u>364TS, 365TS</u> 225M, 2 404TS, 405TS 250S, 2 444TS, 445TS 280S, 2 447TS, 449TS –	225M, 225L 250S, 250M 280S, 280M	52 3/8			29 1/2	/2	34 1/8 35 1/8 34 1/8	8 //16	33 1/16 39 9/16 45 13/16 51 1/16	5 1/16 21 5/8 9 9/16 24 13/16 27 3/4			6 1/16	19 1/8 21 1/2 25 1/4 34 3/4	9 9/16 10 3/4 12 5/8 17 3/8	13 7/8		32 1/4	14	8 1/8 9 1/8 10 1/8 11 1/8 11 1/8	R

10

rrangement .





FOR DB DISCHARGE: ONLY MODELS H AND J FOLLOW FIG. 7 OR 17. ALL OTHER MODELS FOLLOW FIG. 9 OR 19.

Setting the Standard For Quality



Innovative Engineering **Through Application Analysis** 





Global Service Only a Click Away

#### Sales Offices Throughout North America

Chicago Blower Fans are also manufactured worldwide:

Argentina, Australia, Brazil, Chile, China, Colombia, Denmark, Germany, Greece, Holland, Hong Kong, India, Indonesia, Israel, Italy, Japan, Korea, Malaysia, New Zealand, Norway, Philippines, Portugal, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Thailand, Taiwan, Turkey, Venezuela.

Quality Fans Shaped With Skill and Pride

## Your Primary Source For Every Fan Requirement

#### General Duty -

or supply air

fans for clean exhaust

Industrial Duty -Airfoil and vane axial

Fans to handle dirty and corrosive environments

Heavy Duty -

Custom engineered fans for specific applications



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